Fire Weather Services for Southeast North Carolina and Northeast South Carolina

Operating Plan

NWS Wilmington, North Carolina
Revised February 2003

This operating plan will be a semi-permanent document, specifying services provided by the National Weather Service in Wilmington, North Carolina. The plan incorporates procedures detailed in the National Agreement for Meteorological Services in Support of Agencies with Land Management and Fire Protection Responsibilities.

Operating Plan for Fire Weather Services
for
Southeast North Carolina
and
Northeast South Carolina

February 2003

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U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
Wilmington, North Carolina

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I. Introduction

Weather support for forestry operations in southeast North Carolina and northeast South Carolina is provided by the NWS office in Wilmington, North Carolina. This includes routine daily forecasts, spot weather forecasts, and forecasts of Red Flag events for the area.

I.1 Purpose

This Operating Plan is issued in lieu of a formal local Memorandum of Understanding (MOU) between the NWS Wilmington and the federal, state, and local land management agencies that rely on weather support for routine and emergency operations. This plan outlines NWS operations and services available to users including products and formats, dissemination and coordination, and the responsibilities of the users.

I.2 Objective

The Fire Weather Program at NWS Wilmington aims to provide weather support to land management agencies for use in wildfire suppression, fire presuppression activities, and planning and training related to these functions. The goal of this support is the protection of life and property as well as the reduction of the loss of natural resources caused by the adverse impact of weather on fire behavior.

This Operating Plan for Fire Weather Services conforms with the National Agreement for Meteorological Services in Support of Agencies with Land Management and Fire Protection Responsibilities, concluded in March of 1983. The National Agreement can be found in Appendix A.

This Operating Plan will be the governing document for fire weather procedures and cooperation between the following agencies:

NWS Weather Forecast Office Wilmington, North Carolina
National Park Service
U.S. Fish and Wildlife Service
North Carolina Forest Service
South Carolina Forestry Commission

I.3 Users

Users shall be defined as any person, group, agency, or body which uses the products and services provided by the NWS in support of fire operations.

II. Organization

II.1 National Weather Service Headquarters

NWS Headquarters, located in Silver Spring, Maryland, establishes policies and coordinates the national fire weather program. The national program manager coordinates the program with the regional program managers. The national program manager also works with the national headquarters of the federal forestry and land management agencies as well as the Association of State Foresters in determining overall forestry and land management requirements for meteorological support. The national program manager coordinates national training in forestry and fire weather for NWS forecasters.

II.2 National Weather Service Regional Headquarters

Regional Headquarters manage the technical operational aspects of the fire weather program within each region. They also provide guidance and assistance to meteorologists-in-charge (MIC) on program operations and problems through Regional Operations Manual Letters (ROMLs) and conferences. Regional Headquarters advise NWS Headquarters on matters pertaining to technical planning and operations. The regional program managers coordinate regional fire weather programs and advise the Regional Directors on the operational and administrative aspects of these programs.

II.3 Weather Forecast Office (WFO)

WFOs prepare and disseminate forecast products for all sectors of the population, including those for the Fire Weather program. These offices are responsible for providing forecasts to user agencies within their County Warning and Forecast Area (CWFA). Most offices have a designated fire weather program leader. A list of organizational contacts is in Appendix B.

II.3.1 Meteorologist-in-Charge (MIC)

The MIC is responsible for the provision of adequate forestry and fire weather services in the office's assigned area of program responsibility. The MIC will ensure that the program leader is provided adequate time for user liaison and assistance activities.

II.3.2 Fire Weather Program Leader (PL)

Fire weather program leaders (also known as focal points) are the customer service representatives for the program. Acting as the representative of the MIC, the PL will be in regular contact with land management agencies to help them assess meteorological needs, to inform them of NWS products and services available to meet these needs, and to educate them in the most effective use of the various NWS products and resources, including NOAA Weather Radio (NWR). PLs will work with users to aid them in utilizing existing NWS products and services produced for other programs that could meet the requirements of wildland management. The PLs are also tasked with ensuring staff meteorologists are trained and maintain proficiency in preparing forecast products in support of the fire weather program.

The NWS WFO in Wilmington, North Carolina will provide these services 24-hours a day, 365 days per year. WFO Wilmington, NC can be reached at:

National Weather Service
2015 Gardner Drive
Wilmington, NC 28405

Richard Anthony, Meteorologist-in-Charge
John Quagliariello, Fire Weather Program Leader

Internet web site: http://www.erh.noaa.gov/ilm

Phone: 910-763-8331 ext 1
910-762-4289
Fax: 910-762-1288

NOTE: These phone numbers are UNLISTED coordination numbers and should not be released to anyone other than persons or agencies that have a legitimate fire weather concern.

III. Operational Program

III.1 Fire Weather Forecast Area

NWS forecast areas are tied to the "radar umbrella" of the WSR-88D Doppler Radar. The umbrella is the area covered by the radar volume scan. This means that forecasts issued by the NWS are not bound by state political boundaries.

The WFO Wilmington, NC area covers southeast North Carolina and northeast South Carolina. A map of the area for which NWS Wilmington will issue Fire Weather forecasts is in Appendix C.

The counties covered by WFO Wilmington, NC include:

<u>In North Carolina:</u>			
Bladen	Brunswick	Columbus	New Hanover
Pender	Robeson		
<u>In South Carolina:</u>			
Darlington	Dillon	Florence	Georgetown
Horry	Marion	Marlboro	Williamsburg

National Parks covered by the WFO Wilmington, NC:
Moores Creek National Battlefield

U.S. Fish and Wildlife National Wildlife Refuges covered by the WFO Wilmington, NC:
Waccamaw NWR

III.2 Fire Weather Season

Traditionally, the fire weather season over the eastern Carolinas is split into two seasons. The first of these extends from late winter through the time of full greening in the spring. The second occurs during the relatively dry fall months as leaves fall from the trees. However, pre-suppression fire weather forecasts will be prepared year round by WFO Wilmington, NC.

III.3 Fire Weather Forecasts

The National Weather Service issues three types of fire weather forecasts: pre-suppression forecasts (or routine or daily forecasts), spot (or site specific) forecasts, and National Fire Danger Rating System (NFDRS) forecasts.

III.3.1 Pre-suppression Forecasts

The pre-suppression forecast is a general forecast prepared twice daily by the duty forecaster and issued by 830 AM and around 300 PM. The pre-suppression forecast covers 6 counties in southeast North Carolina and 8 counties in northeast South Carolina. This geographic area encompasses portions of North Carolina Forest Service Districts 6 and 8, part of South Carolina Forestry Commission Pee Dee Region, Moore's Creek National Battlefield, and the future Waccamaw National Wildlife Refuge. The pre-suppression forecast is used for day-to-day planning of land management operations and for determining general weather trends which might impact fire behavior.

The pre-suppression forecast will follow the format established by the Eastern Region of the National Weather Service with modifications agreed to by land management agencies in North and South Carolina. The forecast will forecast values for all of the following weather elements: sky conditions; maximum and minimum temperatures; minimum and maximum relative humidity values; wind speed and direction; probability of precipitation; precipitation type, duration and amount; mixing heights; transport wind; ventilation and smoke management levels; wind profiles (from March 1 through May 31); and a stability index. The forecast values will reflect the duty forecasters expectation of the most probable weather conditions. Sample morning and afternoon forecasts are displayed in Appendix D.

The pre-suppression forecast will be divided into meteorologically similar zones such that the zone groupings may vary on a day-to-day basis. The office forecast philosophy will be to group the zones to reflect the expected weather conditions and not to reflect political boundaries.

III.3.1.1 Issuance Time For Pre-suppression Forecasts

The pre-suppression forecast will be issued twice daily by 830 AM and around 300 PM, with updates as needed.

III.3.1.2 Pre-suppression Forecast Content

The pre-suppression forecast will provide a weather discussion and complete fire weather parameters for the first three periods in the morning forecast and the first four periods in the afternoon forecast. The morning forecast will cover today, tonight, and tomorrow (day 2) while the afternoon forecast will cover tonight, tomorrow, tomorrow night, and the next day (day 2). For the purposes of the presuppression forecast, the daytime periods are defined as 6 AM to 6 PM EST and the nighttime period is defined as 6 PM to 6 AM EST. One hour should be added to the above times during EDT.

III.3.1.2.1 Headlines

Headlines may be included at the beginning of the pre-suppression forecast or at the beginning of any of the zone groupings. Headlines may be included for expected changes in the weather, significant forecast problems (IE., dryness, heat, etc), and non-fire weather advisories, watches, and warnings. Headlines for Fire Weather Watches and Red Flag Warnings will be included in the pre-suppression forecast. In addition, headlines for emergencies declared by state or local agencies will be included upon request. Examples include Red Flag Fire Alerts and Burning Bans.

III.3.1.2.2 Discussion

The DISCUSSION section of the forecast will be a general discussion of weather features expected to affect the area through 7 days. The discussion will be more detailed within 48 hours and become more general in the three to five day range. The discussion should contain information highlighting weather conditions, features, or changes important to fire behavior. Some examples of the type of information that may be included are frontal passages, wind shifts, extreme heat, extreme dryness, strong winds, and thunderstorm formation.

III.3.1.2.3 Wind profile analysis

Wind profile analysis information will be provided on a seasonal basis in the months of **March, April and May** or during times of high fire danger when requested by any of the user agencies listed in section I.2. A strong low level jet (wind speed maximum) can adversely affect fire behavior. The wind profile analysis will state whether the profile is FAVORABLE, QUESTIONABLE, or UNFAVORABLE. A FAVORABLE wind profile forecast indicates expected conditions that **are** favorable for burning. If the wind profile forecast is FAVORABLE, no other information will be provided. An UNFAVORABLE wind profile forecast indicates expected conditions that **are not** favorable for burning . If the profile is UNFAVORABLE, a profile type from Appendix E will be assigned. In addition, the maximum wind speed, direction, and height will be given. A QUESTIONABLE wind profile forecast indicates expected conditions appear to be unfavorable for burning but that more analysis is needed. If the forecast profile is QUESTIONABLE, an update will be issued once it is determined if the profile is FAVORABLE or UNFAVORABLE. This update will generally be issued by 11 AM local time.

III.3.1.2.4 CLOUD AMOUNT

The Cloud Amount will reflect the most probable sky conditions expected in the zone grouping during each period. The following terms will be used to describe sky conditions:

Weather Code (WX)	Definition
CLR	Clear skies
MO CLR	1/10 to 3/10 opaque cloud cover
PT CLDY	4/10 to 7/10 opaque cloud cover
MO CLDY	8/10 to 9/10 opaque cloud cover
CLDY	10/10 opaque cloud cover

III.3.1.2.5 PRECIP CHC (%)

The chance of precipitation expressed as a percentage to the nearest 10 percent, ranging from 0 to 100 percent.

III.3.1.2.6 PRECIP TYPE

The Precip Type will reflect the most probable precipitation type expected in the zone grouping during each period. If the PRECIP CHC is less than 20 percent, NONE will be forecast. The following terms will be used to describe expected weather:

PRECIP TYPE	Definition
NONE	No precipitation or only isolated precipitation
DRIZZLE	Drizzle - Trace amount of precipitation
RAIN	Rain
SHOWERS	Rain showers
TSTMS	Thunderstorms
FRZ RAIN	Freezing Rain
SLEET	Ice pellets
SNOW	Snow
RAIN/SNOW	Rain/Snow mix
FRZ DRZL	Freezing Drizzle

III.3.1.2.7 MAX/MIN TEMP

Forecast temperatures will reflect the expected maximum daytime temperature and the expected minimum nighttime temperature. Typically, the maximum temperature occurs during the mid to late afternoon while the minimum temperature occurs just before sunrise. There will be times when the temperature does not follow this normal pattern. When this is expected to occur, it will be noted in the REMARKS section of the forecast and may also be noted in the DISCUSSION section of the forecast.

III.3.1.2.8 AM WIND / PM WIND

Wind forecasts will be comprised of expected wind direction and sustained wind speed. During daylight periods, a morning wind (AM WIND) and afternoon wind (PM WIND) will be included in the forecast. Wind direction forecasts will be to 16 points of the compass and reflect the direction from which the wind is blowing. Wind speed forecasts will reflect the maximum sustained wind speed expected in miles per hour (mph) during the forecast period. If significant wind gusts or wind shifts are expected, it will be noted in the REMARKS section of the forecast and may be noted in the DISCUSSION section of the forecast.

III.3.1.2.9 PRECIP AMOUNT

The amount of precipitation expected during the 12 hour forecast period. Regardless of the PRECIP TYPE, forecast precipitation amounts are always liquid water amounts. PRECIP AMOUNT will only be forecast when the PRECIP CHC is 50 percent or higher.

III.3.1.2.10 PRECIP DURATION

The amount of time during the 12 hour period that precipitation is expected. The duration time represents the total number of hours precipitation will fall during the forecast period. Like PRECIP AMOUNT, PRECIP DURATION will only be forecast when the PRECIP CHC is 50 percent or higher.

III.3.1.2.11 HUMIDITY (%)

Forecast relative humidity values will reflect the expected minimum daytime relative humidity and the expected maximum nighttime relative humidity. Typically, the minimum daytime relative humidity occurs during the mid to late afternoon while the maximum nighttime relative humidity occurs just before sunrise.

III.3.1.2.12 Davis Stability Index (DSI)

Atmospheric stability will be forecast for the layer from the surface to approximately 5,000 feet. The forecast value will apply to the afternoon hours. The stability indices and their characteristics are listed below:

1 = STABLE - temperatures aloft decreasing with altitude at a rate of less than 3.5 degrees F per 1,000 feet (6.4 degrees C/km).

2 = CONDITIONALLY UNSTABLE - temperature decreases with altitude at the rate of 3.5 degrees F to 5.4 degrees F per 1,000 feet (6.4 to 9.7 degrees C/km) . Conditionally unstable air tends to become unstable if forced to rise. Additional heat, such as a fire, supplied at the surface can be sufficient to produce the needed rise.

3 = UNSTABLE - temperature decrease with altitude of 5.5 degrees F per 1,000 feet (9.8 degrees C/km).

4 = ABSOLUTELY UNSTABLE - temperature decrease with altitude greater than 5.5 degrees F per 1,000 feet (9.8 degrees C/km).

III.3.1.2.13 Smoke Dispersion and Inversion Information

Inversion related information (INVERSION) will be forecast for all forecast periods of the forecast. Mixing height (MIXING HGT), transport winds (TRANSPORT WIND), and ventilation rate (VENTILATION RATE) will be forecast for the daytime periods only.

Inversions will be forecast under the INVERSION header if expected below 1000 feet. If expected during the daytime period, a burn off time and temperature will be included. If the inversion is expected to persist all day, “CONTINUED” will be forecast. For the nighttime period, the onset time will be forecast unless the inversion is “CONTINUED” from the daytime. If no inversion is forecast, “NONE” will be inserted under INVERSION for the nighttime period. All times will be local time.

Mixing height (MIXING HGT) forecasts will be given to the nearest 100 feet. Transport winds (TRANSPORT WIND) will be forecast to the nearest 1 mile per hour (mph) with an 16 point wind direction denoting from which direction the winds are expected to blow.

Ventilation rate (VENTILATION RATE) will be forecast in units of ft-mph. To compute the applicable burn category for the area, users can consult the reference table attached to the end of the forecast. See Appendix D for sample forecasts and the included tables.

Smoke dispersion will not be directly forecast due to differences in wind tables governing the forecast for each state. Users in North Carolina and South Carolina can consult the conversion table which will be provided at the end of the forecast (See Appendix D).

III.3.1.2.14 Remarks

The remarks section will contain any information necessary to further clarify the forecast. Possible examples include wind shift information, more detailed inversion information, and precipitation timing information.

III.3.1.2.15 Extended Forecast

The extended forecast will be a general forecast of expected weather covering the period from the day 2 night period through seven days out in time. The extended forecast will include a temperature forecast and precipitation forecast. If no precipitation is expected, no precipitation descriptors will be included in the extended. Instead, forecast sky conditions may be included.

III.3.1.2.16 Day 3 to 5 Winds

Winds for days 3 through 5 will be included in the FWF. If winds less than 15 mph are expected, the forecast will state this. For winds 15 mph or more, the wind direction will be included in the forecast.

III.3.1.2.17 The 8 to 14 Day Outlook

The 8 to 14 day outlook will cover day 8 through day 14 from the day the forecast is issued. The forecast will be a general outlook of expected temperature and precipitation in relation to climatological normals.

III.3.2 Spot Forecasts

Spot forecasts are special, non-routine forecasts prepared upon request from user agencies that need site specific weather forecasts for: 1) controlling the spread of wildfire; 2) planning and managing prescribed fires; or 3) other specialized forest management activities. In the event of an emergency which threatens life and/or property, spot forecasts can also be provided to any federal, state, or local agency.

Spot forecasts are highly detailed forecasts prepared for a specific location within the forecast area. The forecasts may contain any or all of the following weather elements: sky conditions; maximum and minimum temperatures; minimum and maximum relative humidity values; wind speed and direction; probability of precipitation; precipitation type, duration and amount; mixing heights; transport wind; inversion height; inversion onset and burn off times or temperatures; ventilation and smoke management levels; wind profiles; stability indices (IE., Haines Index) and lightning activity levels (LAL).

III.3.2.1 Requests for Spot Forecasts

Spot forecasts will be prepared when requested by a user agency. Federal, state, and local agencies may request spot forecasts in support of wildfire suppression or other emergencies where lives and/or property may be threatened. Due to the detailed and specific nature of this forecast product, it is imperative that the user provide the forecaster with necessary and sufficient information so that a reliable forecast can be prepared.

Requests for spot forecasts should be made by using the web based spot forecast request form. This form along with instructions on how to use it are available on the fire weather page of the NWS Wilmington, NC web site (http://www.erh.noaa.gov/ilm). The web based spot forecast request form should be filled out as completely as possible by the user agency prior to submitting the request.

In times when internet access is hindered or not possible, spot forecasts may be requested and disseminated via fax or phone. If faxing a request, users should use the Fire Weather Special Forecast Request Form, WS Form D-1 (Appendix F). Section I of WS Form D-1 should be filled out as completely as possible by the user agency prior to submitting the request by fax to the forecast office. If the request is made by phone, all the information in Section I should be provided to the forecast office.

While there is no dedicated fire weather forecaster, the forecast office will give a high priority to spot forecasts in the absence of weather phenomena in the CWFA that pose a threat to life and property. To ensure that the request for a spot forecast is handled properly and appropriately, users agencies should adhere to the following guidelines:

1) Allow adequate time for the forecaster to prepare the forecast. This will normally be between 20 and 30 minutes. On particularly busy fire weather days, spot forecasts will be handled on a first-come, first-served basis, with wildfires or other life threatening events taking the highest priority.

2) Provide as much on-site or near-site weather information as possible. At a minimum, the user must provide at least one observation within an hour of the request. This observation must contain the following: location of observation; elevation at the observation site; time of the observation; wind direction, speed, and level (eye or 20 foot); dry and wet bulb temperatures; any remarks about the state of the weather, particularly anything that may affect fire behavior. If possible, include some observations from the previous day that might give the forecaster an indication of daily trends.

3) As much as possible, specify the time period for which the forecast is needed.

4) As much as possible, specify the weather elements of most importance for which a forecast is needed and/or critical values of these elements.

5) Provide a contact point name and phone number where the forecaster can call back, if necessary. (Also include a fax number for returning completed forecasts if the web based spot request form is not used).

6) In order to receive prompt attention for a fax request, please phone the office to let the forecaster know the request is on the way.

7) Land management personnel should contact NWS Wilmington, NC for a spot update if forecast conditions appear unrepresentative of the actual weather conditions.

Whenever possible, users should provide feedback, positive or negative, to the NWS office in Wilmington, NC on the performance of the spot forecast during or shortly after an event. This will assist forecasters in subsequent forecasts for the same or similar conditions.

III.3.3 National Fire Danger Rating System (NFDRS) Forecasts

NFDRS forecasts are issued once daily for NFDRS sites which have provided an NFDRS observation that same day. Presently, NFDRS forecasts are issued for NFDRS observation sites at the following locations: the DOD site at Sunny Point Military Ocean Terminal; the Nature Conservancy site near Supply, NC; the North Carolina Forest Service site at Whiteville, NC; and the North Carolina Forest Service site at Jones Lake, NC. National guidelines for the NFDRS program allow for the issuance of both point and trend forecasts for each site. However, until a climatology can be built up for the sites, only NFDRS point forecasts will be issued. Sample NFDRS forecasts are displayed in Appendix G.

III.3.3.1 Issuance Time For NFDRS Forecasts

The NFDRS forecasts will be issued once daily by 2000 UTC provided an appropriate NFDRS observation has been received by the National Weather Service. Updates to NFDRS forecasts are not required.

III.3.3.2 NFDRS Point Forecast Content

NFDRS Point Forecasts are a forecast for weather expected at 1800 UTC the following day. The format of Point Forecasts and a sample forecast are shown below.

FCST,IdIdIdIdIdId,YYMMDD,HH,WX,DB,RH,L,N,DDD,FF,,TX,TN,HX,HN,D1,D2,F
Sample - FCST,319701,020112,13,2,56,50,1,1,ENE,2,,67,34,82,46,0,0,N

A decoded list of the fields in the above sample follows below.

FCST - Indicates this is a point forecast
IdIdIdIdIdId (319701) - Site Identifier
YYMMDD,HH (020112,13) - Date and hour forecast is valid (Jan 11, 2002 1300 EST)
WX (2) - Forecast state of the weather code (Broken clouds)

0 - Clear	5 - Drizzle
1 - Scattered Clouds	6 - Rain
2 - Broken Clouds	7 - Snow
3 - Overcast	8 - Showers
4 - Fog	9 - Thunderstorms

DB (56) - Dry Bulb temperature (56 degrees F)
RH (50) - Relative Humidity (50%)
L (1) - Lightning Activity Level (LAL) 1300 today to midnight tonight (None)
N (1) - LAL midnight tonight to midnight tomorrow (None)

LAL Decoder

1 - No Thunderstorms
2 - Isolated Thunderstorms
3 - Widely Scattered Thunderstorms
4 - Scattered Thunderstorms
5 - Numerous Thunderstorms
6 - Same as 3 but dry (little or no rain reaching ground)

DDD (ENE) - Direction from which the wind will blow (east-northeast)
FF (2) - Wind Speed (2 MPH)
TX (67) - Expected maximum temperature through 1300 EST Jan 11 (67 degrees F)
TN (34) - Expected minimum temperature through 1300 EST Jan 11 (34 degrees F)
HX (82) - Expected maximum relative humidity through 1300 EST Jan 11 (82 percent)
HN (46) - Expected minimum relative humidity through 1300 EST Jan 11 (46 percent)
D1 (0) - Expected precipitation duration in hours from 1300 EST today to 0600 EST tomorrow (0 hours)
D2 (0) - Expected precipitation duration in hours from 0600 EST to 1300 EST tomorrow (0 hours)
F (N) - Wet fuels flag (No - indicates fuels are not expected to be moist from precipitation)

III.4 Fire Weather Statements, Watches, and Warnings

During periods in which critical fire weather conditions are expected or imminent, the NWS will issue statements, watches, and warnings to describe the level of urgency to the appropriate user agencies. These issuances will be coordinated with land management agencies.

III.4.1 Definition of a Red Flag Event

A Red Flag Event occurs when critical weather conditions develop which could lead to extensive wildfire occurrences or to extreme fire behavior. Red Flag Events represent a threat to life and property and may adversely impact fire fighting personnel and resources. Critical weather conditions include combinations of the following: strong, gusty winds; very low relative humidity; high to extreme fire danger; significant wind shifts; and lightning. Specific criteria can be found in Appendix H.

III.4.2 Red Flag Warning

A Red Flag Warning will be issued, after coordination with the appropriate land management agencies, when a Red Flag Event is occurring or is imminent. The warning will be issued for all or a portion of the forecast area. It will be issued immediately once the forecaster and appropriate land management agency have determined that a Red Flag Event is ongoing. Otherwise, it shall be issued for impending Red Flag conditions when there is a high degree of confidence that conditions will develop within 24 hours. The warning will continue until the conditions cease to exist or fail to develop as forecast. At such time, the warning will be canceled. A sample Red Flag Warning and cancellation are in Appendix H.

III.4.3 Fire Weather Watch

A Fire Weather Watch will be issued, after coordination with the appropriate land management agencies, to advise of the possible development of a Red Flag Event in the near future. It will be issued for all or part of the forecast area. A Fire Weather Watch is issued when the forecaster and appropriate land management agencies are reasonably confident that a Red Flag Event will occur. A watch should be issued 12 to 48 hours in advance but shall not be issued more than 72 hours in advance of the expected onset of critical weather conditions. The watch will remain in effect until either it is determined the Red Flag Event will not develop or that the watch should be upgraded to a warning. If conditions are not expected to occur as forecast, the watch will be canceled. A sample fire weather watch and cancellation is in Appendix H.

III.4.4 Red Flag Fire Alert

A Red Flag Fire Alert will be issued by the South Carolina Forestry Commission with meteorological input from the NWS Forecast Office in Columbia, South Carolina (CAE). The Alert will be issued when conditions that support potentially destructive or widespread forest fires exist. As part of its support of forestry operations, NWS CAE will disseminate the Red Flag Fire Alert under the CAERFDCAE header.

III.4.5 Fire Danger Statements and Blow-Up Alerts

When fire danger or fire occurrence is high and is coupled with critical weather conditions, user agencies may request that the NWS issue a Fire Danger Statement or Blow-Up Alert. These statements will be issued in coordination with the requesting agency and will only be issued with their approval.

IV. Special Fire Weather Services

Special fire weather services are those services that are uniquely required by land management agencies and go beyond the normal forecast operations of the NWS. Special services include Advanced Technology Meteorological Unit (ATMU) and Incident Meteorologist (IMET) deployment, station visits, weather observer training, participation in user agency training, and other pertinent meteorological services.

Typically, special services require NWS personnel to be away from the forecast office and to be in overtime status in some cases. User agencies are responsible for covering the cost of NWS overtime, travel, and per diem expenses. Reimbursement of costs for special services will be as outlined in the **National Agreement for Meteorological Services in Support of Agencies with Land Management and Fire Protection Responsibilities (Appendix A).**

IV.1 Advanced Technology Meteorological Unit (ATMU) Services

The ATMU is a modular and mobile system of equipment used by an IMET for data collection and product preparation. ATMUs are a national resource with 25 of them being cached around the country, mainly in the western states. The nearest ATMU cache to WFO Wilmington is London, Kentucky where two are maintained.

An ATMU consists of two modules. The first contains a theodolite with tripod and a calculator for computing winds aloft, 2 belt weather kits, weather balloons, a nozzle and regulator for a helium tank, office supplies, and miscellaneous expendables. It is 27.6 cubic feet and weighs a little over 200 pounds. The second module, known as the computer module, contains a laptop computer with a satellite docking station, a satellite dish for down linking weather data, and a printer. The computer module is 5 cubic feet and weighs 55 pounds. A third module, the microREMS, is a self-contained portable weather station with instruments for measuring temperature, dewpoint, and wind. It is powered by a solar panel and a battery, is 8.2 cubic feet, and weighs 125 pounds.

Requests for the ATMU, microREMS, and IMET should be made through the USDA Forest Service Region 8 Dispatch. The Meteorologist-in-Charge or the Fire Weather Program Leader at WFO Wilmington should also be notified of the request. Typically, the IMET nearest the incident will be deployed. WFO Wilmington does not have an IMET assigned to the station so it would be an IMET from a nearby office. USDA Forest Service Regions should have a list of available IMETs. During times of limited resources, an IMET from a different area of the country may be assigned to fill the request.

The requesting agency is responsible for coordinating transportation of the ATMU and IMET to and from the incident. The requesting agency is also responsible for any storage of the unit while in transit and for shelter for the IMET and ATMU at the incident site. A sheltered work area, at least 50 square feet in area with a table and chair must be provided. The work area must be protected from excessive dust, free of standing water or condensation, and must be heated and /or cooled sufficiently to allow efficient operation of equipment. Power (120 V AC) is required for the ATMU's electrical equipment and priority telephone access during certain short periods each day must be made available.

Upon arrival at the incident and after going through the appropriate check-in procedures, the IMET will:

1. Brief the Fire Behavior Analyst (FBAN), Planning Section Chief (PSC), and the Incident Commander (IC) on current and expected weather affecting the fire.

2. Establish a schedule with the IC and FBAN for written forecasts and formal briefings.

3. Request a briefing of the fire situation and potential behavior problems from the FBAN. As time and resources permit, incident management should arrange for an areal inspection trip of the fire by the IMET and should provide the forecaster with current fireline maps. If possible, the IMET should be assigned a radio with a fireline frequency.

4. In cooperation with the FBAN and PSC, arrange for a schedule of observations from key points around the fire and from nearby lookouts and fire danger stations. On large fires, some personnel (at least two) should be permanently assigned this duty. On smaller fires, this information can be provided by Division Supervisors equipped with belt weather kits.

IV.2 Fire Weather Training

NWS meteorologists will be available to assist in user oriented training, such as fire behavior training (eg, S-390) and other weather related courses. Requests should be made through the Meteorologist-in-Charge as early as possible after dates for such training have been determined.

IV.3 Other Special Services

Other special services include weather station visits by user agency personnel, weather observer training, and course development work. These activities would typically be at the full expense of the requesting agency unless other arrangements have been made.

V. Fire Weather Observations

V.1 Fire Weather Observation Stations

Fire weather observation stations provide the specialized weather observations for fire weather forecasts, wildfire control and suppression, and various other land management operations. These stations were selected very carefully in each state and federal district. Sites were chosen to represent homogeneous conditions across a district. Stations may either be manned sites operated by land management agencies or unmanned Remote Automatic Weather Stations (RAWS), maintained by any of the federal or state land management agencies in the area.

All observation stations are assigned a 6-digit identification/location number. The first two digits indicate the state, the second two digits indicate the county, and the last two digits indicate the consecutively assigned station number for that county. Land managers who wish to have a number assigned to a station should contact the local NWS office. RAWS stations are also assigned an 8-character alphanumeric identifier based on satellite transmission time (the DCP number, issued by the National Environmental Satellite Service (NESS)). Observations from a RAWS site will be entered manually into the Weather Information Management System (WIMS) under the 8 character identifier but must be entered manually at 1400 LDT (1300 LST) under the 6-digit station number for the National Fire Danger Rating System (NFDRS) calculations.

V.2 Fire Weather Observation Quality Control

The fire weather program is a cooperative effort between the NWS and land management agencies. Accurate and timely weather information is one of the most important tools available to the land manager. Observations are the most important single effort that the control agencies put into the fire weather program. The observations entered into WIMS are direct input for the NFDRS output.

Observers should keep in mind that the weather observations they are taking are as much for their own use as for use by the NWS. For this reason, it is very important that fire weather observers be adequately trained to provide consistently timely and representative observations. Every effort should be made to ensure the quality of the observations before entry into WIMS. If an observation is known to be in error, it should not be entered into the system.

V.3. Training Personnel and Maintaining Sites

The responsibility for training observers is with the user agencies. However, the NWS will be available to assist when requested to do so. Any expenses incurred by the NWS will normally be charged to the user agency, unless other arrangements have been made.

The user agencies are also responsible for maintaining observation site equipment. NWS personnel may accompany the user on maintenance trips or for annual inspection visits which could also serve as liaison with the users.

V.4 Supplies

Most items for taking and recording observations will be furnished by the user agency. The NWS will furnish a few select forms and/or charts upon request.

VI. Communications

The primary means of communication used by the NWS is the Advanced Weather Interactive Processing System (AWIPS). Products transmitted by this means include pre-suppression forecasts, Fire Weather Watches, Red Flag Warnings, and Fire Danger Statements.

Spot forecasts will be disseminated only to the requesting agency by means of telefax (FAX). Therefore, it is necessary for the requesting agency to supply a FAX number when asking for a spot forecast. A voice number should also be included in case problems are encountered with the fax transmission.

Other means of communication may be utilized upon mutual agreement with user agencies.

List of Appendices

APPENDIX A

INTERAGENCY AGREEMENT
for
METEOROLOGICAL SERVICES

Among the
Bureau of Land Management
Bureau of Indian Affairs
U.S. Fish and Wildlife Service
National Park Service
of the
United States Department of the Interior
and the
Forest Service
of the
United States Department of Agriculture
and the
National Weather Service
of the
United States Department of Commerce

BLM Agreement No. 1422RAI02-0030
BIA Agreement No.
FWS Agreement No.
FS Agreement No. 02-IA11130206041
NPS Agreement No.
NWS Agreement No. 201-02-002

1.0 INTRODUCTION.

Fire management and suppression in the nation's wildlands is an on-going concern to the American public and to the Department of the Interior's Bureau of Land Management, Bureau of Indian Affairs, Fish and Wildlife Service, and National Park Service, and the Department of Agriculture, Forest Service, as well as to the Department of Commerce, National Oceanic and Atmospheric Administration-National Weather Service (NWS). Considerable cooperation and coordination among these agencies exists, which is critical to the success of fire management, suppression and safety. This agreement will refer to the National Weather Service as "NWS" and the federal wildland fire management agencies as the "Interagency Wildland Fire Agencies."
The National Weather Service is legally mandated to issue weather forecasts and warnings for the protection of life and property. The Interagency Wildland Fire Agencies are responsible for the stewardship and/or protection of lands owned or held in trust by the United States or under the jurisdiction of state agencies.

The NWS and Interagency Wildland Fire Agency responsibilities are defined in Section 5. The NWS Weather Forecast Office (WFO) products and services shall be focused on respective County Warning Forecast Areas (CWFA) for the operational concerns of local wildland fire agency districts, while Interagency Wildland Fire Agencies shall focus on geographic area and national level products and services. The needs of geographic areas are met using a geographic area Memorandum of Understanding and/or geographic specific Annual Operating Plan (AOP) - (see appendix 1 for a suggested outline), and this Interagency Agreement. The NWS and Interagency Wildland Fire Agencies will coordinate and cooperate on developing fire weather policy, standards and guidelines

2.0 AUTHORITIES.

A. Economy Act of June 30, 1932 (47 Stat. 417; 31 U.S.C. 1535), as amended.

B. Travel Authority (5 U.S.C. 5702).

C. Organic Act of 1890 (15 U.S.C. 313).

D. Joint Project Authority (49 U.S.C. 44720).

E. Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.).

F. National Park Service Organic Act of August 1916 (16 U.S.C. 1).

G. National Wildlife Refuge Administration Act of June 27, 1998 (16 U.S.C. 668dd)

H. Disaster Relief Act of 1974 (42 U.S.C. 5147).

I. National Indian Forest Resources Management Act of 1990 (25 U.S.C. 3101 et seq.).

J. Cooperative Forestry Assistance Act of 1978 (P.L. 95-313, 92 Stat. 365 as amended; 16 U.S.C. 2101 (note), 2101-2103, 2103a, 2103b, 2104-2105).

K. Federal Fire Prevention and Control Act of October 29, 1974, (P.L. 93-498, 15 U.S.C. 2201 et seq., 88 Stat 1535.)

3.0 PURPOSE.

The purpose of this Inter-Agency Agreement is to combine resources and provide complementary services without duplication to best serve the needs of the public and all agencies for the protection of life, property and resource values to enhance ecosystem health. Accurate and timely meteorological and fire danger information is required to manage these resources effectively and efficiently. It is also the purpose of this Agreement to set forth the terms and conditions under which the NWS will continue to provide meteorological services to support these efforts as requested by the Interagency Wildland Fire Agencies. It is with this knowledge that this Inter-Agency Agreement is entered into.

This Agreement supersedes the "National Agreement for Meteorological Services in Support of Agencies with Land Management and Fire Protection Responsibilities" among the six participating agencies, as listed above, that was effective June 1983.

4.0 OBJECTIVES.

The objectives of this Agreement are:

A. To identify meteorological services to be provided;

B. Establish interagency relationships; and

C. Define obligations of the NWS and Interagency Wildland Fire Agencies.

5.0 RESPONSIBILITIES.

The responsibilities listed are not all-inclusive, but are meant to provide the overall scope of services provided by the respective agencies.

A. The National Weather Service agrees to:

All obligations undertaken by the NWS under this Agreement are subject to the availability of appropriated funds.

1. Provide Basic Meteorological Services: Basic Meteorological Services will be provided in accordance with the Annual Operating Plan (AOP) for Fire Weather Service for designated NWS offices. These services will be made available without cost to Interagency Wildland Fire Agencies and will include:
    a. Routine fire weather forecast and updates during the designated period outlined in the AOP.
    b. Extended and long-range weather and climate outlooks.
    c. NWS weather observations.
    d. Fire Weather Watch and Red Flag Warning program.
    e. Site-specific forecasts for wildland fires or special federal projects (i.e. spraying, seeding, fuels management, or search and rescue operations).
    f. Provide consultation and technical advice in support of basic services to Interagency Wildland Fire Agencies.
    g. Provide weather information to a central communication gateway and the internet for Interagency Wildland Fire Agencies' use and further distribution.
    h. Provide a cadre of Incident Meteorologists (IMET) in support of the fire weather program.
    i. Maintain a current list of offices providing basic meteorological services.
    j. National scale short-range fire weather outlooks.

2. Non-Routine Services: These services will be provided by designated NWS offices.

Expenses above planned salary and operating costs will be borne by the benefiting agency.

a. Weather Observer training.
b. Weather observation station visits.
c. Participation in Wildland Fire Agency training.
    1. Course development.
    2. Classroom instruction.
d. On-site meteorological services.
e. Other special fire management services.

3. Fire Weather Training: The NWS recognizes the need for specialized training in fire weather meteorology for forecasters. Costs associated with training NWS staff will be borne by NWS. The NWS will meet this need as follows:

a. The NWS will ensure all meteorologists producing fire weather products have met the minimum fire weather forecaster training requirements.
b. The NWS will provide specialized training for the purpose of qualifying NWS IMETs.

4. Participation in interagency groups: All NWS costs will be borne by NWS.

5. Wildland fire suppression related activities: The NWS will not charge an administrative surcharge or any other expenditure that is not authorized under the Wildland Fire Agencies' Appropriation Acts related to these activities.

B. Interagency Wildland Fire Agencies

Wildland Fire Agencies' programs provide Geographic Area and national products for the strategic role of resource prioritization and utilization. Specific responsibilities of Wildland Fire Agencies are listed below.

1. Operational Support and Predictive Services

a. Geographic Area and national level fire weather products, services and assessments will be provided for resource allocation and prioritization.
b. Integration of weather and climatic sciences into Geographic Area Coordination Center (GACC) operations.
c. Develop value-added products to enhance short and long-range outlooks and projections.
d. Provide weather briefings to GACC and NIFC Coordinators and Multiagency Coordinating Groups.
e. Manage weather and climatology portions of GACC web site.
f. Manage agency fire weather infrastructure.
g. Smoke management.

2. Program Management

Program management of federal land management and fire agencies' fire weather responsibilities, which includes:

a. Program coordination with state agencies.

b. Programmatic guidance, evaluation and certification.
c. Advice and staff support to Fire Directorate
d. Manage weather station network.
e. Liaison between field users and service providers.
f. Participation in activity reviews.

3. Monitoring, Feedback and Improvement
   a. Transmit feedback to product and service providers.
   b. Suggest improvements to providers of products and services received.
   c. Advise agencies on quality control of weather observations.
   d. Coordination with NWS and users in assessment and evaluation of program effectiveness.
   e. Fire weather expertise in accident/incident investigations.

4. Technology Transfer
   a. Transfer meteorology and climatology knowledge to field level personnel.
   b. Promote proper usage by agency personnel of weather and climate products and services.
   c. Conduct training/expertise needs assessment.
   d. Coordinate data and technology acquisition.
   e. Participation on training cadre.

5. Agency Computer Systems
Where fire management computer systems are locally available, access to the systems will be granted to NWS to provide services, as needed. Costs will be borne by the Interagency Wildland Fire Agencies for requirements that are beyond the distribution of weather information through a central communications gateway.

6. Fire Weather Observations:
   a. Provide routine surface weather observations to NWS.
   b. Provide all equipment, equipment maintenance, inspection of weather observation sites, and data quality control.
   c. Pay all travel and per diem costs associated with Interagency Wildland Fire Agencies' requests for visits of NWS personnel to weather observing sites.
   d. Provide for collection, storage and retrieval of remote automatic weather stations (RAWS) data.
   e. Provide observations for site specific and other special forecasts.

7. On-Site Meteorological Support:
   a. Pay costs directly associated with on-site meteorological support by NWS personnel. This includes costs incurred by the NWS IMET duty station.
   b. Provide logistical and weather observation support to NWS personnel at onsite operations.
   c. Provide and pay costs associated with telecommunication services.

8. Training:
   a. Pay per diem and travel costs for NWS personnel instructing and providing course development in Wildland Fire Agency training.

b. Provide technical assistance, instruction, and supporting material for NWS sponsored fire weather training sessions.

9. Other Non-Routine Services
Interagency Wildland Fire Agencies will provide logistics support and pay all overtime, travel, and per diem costs of NWS personnel associated with the provision of all other special fire meteorological services, including Wildland Fire agency approved wildland fire familiarization for NWS personnel.

6.0 JOINT RESPONSIBILITIES:

NWS and Interagency Wildland Fire Agencies shall jointly prepare national and Geographic Area specific MOUs and/or AOPs for Fire Weather Services that will set policy and procedures at GACC, NIFC, state or forecast office level, and shall include:

A. Shared responsibilities of all participants shall include, but not limited to weather briefings, training, research, product/service verification as outlined in Geographic Area specific AOPs.

B. Provision for monitoring, feedback and improvement.

C. Procedure for documenting, monitoring and evaluating fire weather products, briefings and services delivered.

D. Provision for monitoring and evaluating advances in science and technology.

E. Provision for efficient means for technology transfer.

F. Provision for participation in fire weather research activities.

G. Provision that on-site IMET services may be provided by Interagency Fire Weather Meteorologist meeting NWS standards only when NWS IMETs are not available to meet Wildland Fire Agency resource requests on a national basis. The coordination for Interagency Fire Weather Meteorologists will be done between the NWS IMET coordinator and the National Interagency Coordination Center.

H. Provision that NWS meteorologists and Interagency Wildland Fire Agency meteorologists stationed at GACCs and at NIFC will work together to ensure fire agency decision makers receive consistent and coordinated fire weather products and services.

I. Provision that the NWS and Interagency Wildland Fire Agencies will jointly develop and share technology including meteorological software and data, Advance Technology Meteorological Units, portable weather stations, etc. to improve abilities and performance.

J. The NWS and Wildland Fire Agency meteorologists shall work closely in all phases of the fire weather forecast and warning program to resolve concerns and avoid potential inconsistencies in products and services prior to delivery to fire agency customers. The goal of all agencies is to

maximize firefighter and public safety through a coordinated delivery of consistent services.

K. The Parties recognize that, given the current administrative process for payments for fire suppression activities, it is not feasible to obligate the full amount of funds that may be required by this Agreement, because the Agreement does not constitute a binding obligation under 31 U.S.C. § 1501 since it cannot anticipate the specific goods or services for which payment will be requested, or the individual payment amounts, in each future case. This information can only be provided by Resource Orders executed when the goods or services are requested. At the same time, the Parties recognize that Resource Orders are insufficient to constitute a binding obligation under the statute because there is no evidence of intent to be bound, no authorized signatures are present, and no legal authorities are cited. However, these requirements are satisfied by the Agreement. The two documents, when taken together, contain all the elements required for an obligation under the statute. Hence, the Parties agree that this Agreement shall automatically be incorporated by reference into any Resource Orders issued under it, and that an obligation of funds will occur at the time the NWS presents a copy of this Agreement and the Resource Orders for payment. The parties also agree to work toward a more efficient resolution of this administrative process for obligation and payment of fire suppression funds.

7.0 STATEMENT OF WORK.

Procedures for notification of and obtaining services from the NWS will be prepared and specified in the Annual Operating Plans (AOP) and/or in the MOUs for the Geographic Area Coordinating Centers, and in the Geographical Area and National Mobilization Guides. An electronic copy of the *National Mobilization Guide* can be viewed via www.nifc.gov - select "National Interagency Coordination Center" – select "References" link to National Mobilization Guide.

8.0 TRANSFER OF FUNDS.

A. Billing and collection procedures will follow the Intra-governmental Payment and Collection (IPAC) system process.

B. Wildland Fire Suppression Activities: Transfers under this subsection are under the Disaster Relief Act, 42 U.S.C. § 5147. Reimbursable costs are estimated not to exceed a maximum of $2,000,000.00 per fiscal year. In the event this amount is insufficient for a particular fiscal year, this Agreement may be modified to increase the amount of funding, subject to the availability of funds. This Agreement is automatically incorporated by reference into any Resource Order that is issued under it, constituting a binding obligation. The Interagency Wildland Fire Agencies warrant that they will administratively reserve these funds to ensure that the funds will be available when the obligations are recorded. The recording of the obligations will occur upon the receipt of the billings from the NWS by the applicable Interagency Wildland Fire Agency. The billings, inclusive of copies of this Agreement, the Resource Order(s), and expenditure documentation, will define the specific services, supplied goods and costs for each order, and subsequent obligation and payment.

1. Reimbursement payments for suppression-related activities will be accomplished by submission of billings, which are inclusive of copies of the Resource Orders that define the requested services and goods, and the expenditure back-up documentation. The NWS

will not charge an administrative surcharge or any other expenditure that is not authorized under the Wildland Fire Agencies' Appropriation Acts related to these activities

2. It is the responsibility of the requesting agency/office to provide billing instructions to the NWS office that provided the service, which includes the items listed below. It is also the responsibility of the requesting agency/office to conduct any required verification of costs, authorization of expenditures and reconciliation of payment.

a) The fire name, jurisdictional unit, and incident number (The copy of the Resource Order generally includes this information);
b) Applicable support documentation requirements;
c) A copy of this Agreement complete with signatures;
d) Identification (name and phone number) of NWS financial contact;
e) Provide information to NWS regarding which payment center to send the billings for processing; and
f) Billings and support documentation are to be submitted to the appropriate payment center by the NWS within sixty-days of completion of service.

C. Non-Wildland Fire Suppression Activities: Obligation of funds and payments for non-wildland fire suppression activities that are included in the Annual Operating Plan (AOP) shall be accomplished by Task Orders against this Agreement between the concerned agencies by the responsible officers at the appropriate level operating within their authority.

1. All funding obligations must be placed against the individual agency/office's Task Order number and not against this Agreement number.

2. Task Orders to this Agreement may be approved and signed for the NWS by the Director, Office of Climate, Water and Weather Services.

3. Each federal agency shall make direct settlement from its own funds for all liabilities it incurs under this Agreement.

4. The NWS will not charge any agency that is signatory to this Agreement an indirect administrative surcharges for activities addressed in the respective Annual Operating Plan(s) and Geographical Area MOUs, and are requested through Task Orders or Resource Orders under the *National Mobilization Guide*.

5. Task Orders may be prepared in any format acceptable to the agencies involved in each project. At a minimum, each Task Order written in support of this Agreement will include the following items:

a) Detailed description of services to be done or supplies to be delivered;
b) Description of the deliverables;
c) Performance period for completion;
d) Cost estimates;
e) Identify responsible project officials for each Task Order agency;
f) Payment procedures (applicable billing procedures, identification of codes, method of payment—advance/reimbursement; and
g) Signature(s) by authorized personnel for each Task Order agency.

9.0 TERM OF AGREEMENT.

The terms of this Inter-agency Agreement shall become effective with and upon execution by NWS and any or all Interagency Wildland Fire Agencies and shall remain in effect for a period of five-years from the date the last signature was placed on the signatory section, or until such time as the Inter-agency Agreement is terminated by mutual agreement. Any signatory may terminate their participation in this Agreement by written notice to all other signatories provided that such notice shall be given between the dates of October 1 of any year and February 1 of the following year. Full credit shall be allowed for each party's expense and all non-cancelable obligations properly incurred up to the effective date of termination. The remaining signatories may continue the provisions of this Agreement as long as the NWS remains a signatory.

10.0 RESOLUTION OF DISAGREEMENT.

Should disagreement arise on the interpretation of the provisions of this Agreement, or modifications thereto, that cannot be resolved at the operating level, the area(s) of disagreement shall be stated in writing by each party and presented to the other party for consideration. If agreement on interpretation is not reached within thirty-days, the parties shall forward the written presentation of the disagreement to respective higher officials for appropriate resolution. Conflicts and/or disagreements that cannot be resolved at the regional (GACC) level will be elevated to the National Fire Weather Program Managers for the NWS and Interagency Wildland Fire Agencies. If the conflict cannot be resolved at the National Program Managers level, the conflict will be elevated to the Agency Director level (NWS and applicable Wildland Fire Agency Director) for final resolution.

11.0 GENERAL PROVISIONS.

A. Parties to this Agreement are not obligated to make expenditures of funds or provide services under terms of this Agreement unless such funds are appropriated or services are authorized by either the State Legislatures or the Congress of the United States, or are otherwise available under Section 101 and 102 of the Annual Appropriations Act for Interior and Related Agencies.

B. The points of contact listed in Section 13 will review this Agreement annually.

C. Modifications to this Agreement may be initiated by any signatory agency. The modifications shall not take effect until documented and signed by all signatory agencies.

1. The BLM is designated as the agency responsible for all administrative oversight of modifications to this agreement.

2. Modifications to this Agreement may be approved for the NWS and signed by the Director, Office of Climate, Water and Weather Services, or pursuant to NWS protocol.

D. The signatory Interagency Wildland Fire Agencies agree to consider expansion of this Agreement to cover areas of mutual concern, e.g., changing technology and improved procedures, as opportunities for such cooperation become available.

12.0 WAIVER.

Each party to this agreement does hereby expressly waive all claims against the other party for compensation for any loss, damage, personal injury or death occurring in consequence of the performance of this agreement.

13.0 PRINCIPAL CONTACTS.

The Points of Contact are responsible for coordinating an annual review of the currency and adequacy of this Agreement among the signatories, and/or their designees.

National Weather Service:
National Fire Weather Program Manager
Rusty Billingsley
National Weather Service
3833 South Development Ave.
Boise, ID 83705
208/334-9824 – Office
david.billingsley@noaa.gov

Interagency Wildland Fire Agencies:
NIFC Fire Weather Program Manager
Rick Ochoa
National Interagency Fire Center
3833 South Development Ave.
Boise, ID 83705
208/387-5451-Office
rick_ochoa@nifc.blm.gov

14.0 DEFINITIONS.

When the following terms are used in this Agreement, or in an AOP, such terms will have the meanings stated below.

A. **Annual Operation Plan for Fire Weather Services (AOP):** A procedural guide, based on the National Interagency MOU and applicable Geographic Area MOUs, which describes fire meteorological services provided within the Geographic Area of responsibility, including NIFC. At a minimum the AOP will include the items in Appendix 1, *Annual Operating Plan - Required Elements and Suggested Format.*

B. **Assessment:** Fire weather and/or fire danger product based on a thorough evaluation of all pertinent sources of meteorological and fire danger information.

C. **Basic Meteorological Services:** Basic meteorological services are those state-of-the-science meteorological forecasts, warnings, observations and statements produced at a designated NWS office.

D. **Fire Weather Watch:** Fire Weather Watch is issued to advise of conditions, which could result in extensive wildfire occurrence or extreme fire behavior, which are expected to develop in the next 12 to 48 hours, but not more than 72 hours. In cases of dry lightning, a Fire Weather Watch may be issued for the next 12 hours. Fire Weather Watch meteorological and fuel criteria will be defined in the AOP.

E. **Geographic Area:** A geographic boundary designated by Interagency Wildland Fire Agencies, where these agencies work together in the coordination and effective utilization of resources within their boundaries. The *National Interagency Mobilization Guide* identifies the areas encompassed by the eleven Geographic Areas.

F. **Geographic Area Memorandum of Understanding (MOU):** A document, based on the National Interagency Memorandum of Understanding for Meteorological Services, which establishes local policy to meet unique needs of a Geographic Area.

G. **Incident Meteorologist (IMET):** A meteorologist specially trained to provide on-site meteorological support of Wildland Fire Agency designated incidents.

H. **Non-Routine Services:** Meteorological services uniquely required by interagency Wildland Fire Agencies, which usually are not provided from a designated NWS office.

I. **On-Site Meteorological Services:** Special service which dedicates an IMET to an incident so that they are removed from their normal duties.

J. **Predictive Services:** Those Geographic Area/national level fire weather and/or fire danger services and products produced by Wildland Fire Agency meteorologists in support of resource allocation and prioritization.

K. **Red Flag Warning:** Red Flag Warning is used to warn of impending or actually occurring critical weather conditions that could result in extensive wildland fire activity. A warning will be issued when the forecast time of onset is less than 24 hours. Red Flag Warning meteorological and fuel criteria will be defined in the AOP.

L. **Routine Fire Weather Forecasts:** A Routine Fire Weather Forecast is a scheduled narrative and/or matrix forecast of weather parameters pertinent fire management activities in support of protection of life, property, and resources at risk in a given area. The number of parameters may vary due to regional weather requirements, but normally include a brief weather synopsis, expected weather and clouds, duration of precipitation, maximum and minimum temperature/relative humidity, wind direction and speed, transport and stability parameters, and lightning activity level. These forecasts normally cover the next 48 hours and may include input for the computation of National Fire Danger Rating System indices. These forecasts may also include long-range outlooks.

M. **Site Specific Forecasts:** Site-specific forecasts are issued when requested by Interagency Wildland Fire Agencies for wildland fires. These forecasts differ from routine fire weather forecasts by incorporating greater detail in timing, higher resolution of terrain influences, and incorporate meso-scale and sometimes micro-scale weather influences impacting the site.

These may be generated from an office with Wildland Fire supplied information (i.e., location, weather observations, objectives) or generated by an IMET assigned to the incident. Forecast formats may vary but all are highly tailored to satisfy requirements of the incident objectives.

N. **Wildland Fires:** All ignitions that occur on wildlands.

15.0 SIGNATORY.

This Agreement shall be effective on the date the last signature is placed on the signature section and it will remain in effect for a period of five-years from the date of the last signature.

/signed/ 9/26/02
Gregory A. Mandt, Director Date
Office of Climate, Water and Weather Services

/signed/ 10/9/02
Byron J. Green, Contracting Officer Date
Bureau of Indian Affairs

/signed/ 10/24/02
James W. Kurth, for Date
Dan Ashe, Chief, National Wildlife Refuge System
Fish and Wildlife Service

/signed/ 10/30/02
Donna Kalvels, Chief, Contract Office Date
National Park Service

/signed/ 9/30/02
Larry Hamilton, Director Date
Bureau of Land Management-Office of Fire & Aviation

/signed/ 10/31/02
Richard A. Harter, Supervisory Contract Officer Date
Bureau of Land Management-Office of Fire & Aviation

/signed/ 9/30/02
Roger Spaulding, for Date
Phil Street, Director
DOI-Fish and Wildlife Service

/signed/ 9/30/02
Jim Stires, Fire Director Date
DOI-Bureau of Indian Affairs

/signed/ 9/30/02
Sue Vap, National Fire Management Officer Date
DOI-National Park Service

/signed/ 9/30/02
Alice Forbes, Acting Director Date
USDA, Forest Service-NIFC

/signed/ 9/30/02
Tory Majors, Administrative Officer Date
USDA, Forest Service-NIFC

Appendix 1
Annual Operating Plan
Required Elements and Suggested Format

I. INTRODUCTION

The introduction will include a general statement of purpose and an explanation of the relationship between the Annual Operating Plan (AOP) and the Geographic Area Coordinating Center Memorandum of Understanding (MOU) for Meteorological Services, and the Geographic Area Mobilization Guide and/or the National Mobilization Guide will be referenced.

II. SERVICE AREA AND ORGANIZATIONAL DIRECTORY

A. List of weather offices and points of contact
B. List of agencies participating

III. SERVICES PROVIDED BY THE NATIONAL WEATHER SERVICE

A. Basic Services
1. Routine fire weather forecasts
a. Issuance (seasonal, daily)
b. How forecast is issued and accessed
c. Content of the forecast
2. Site-specific wildland fire forecasts
a. Criteria
b. Contents
c. Procedures
3. Fire Weather Watch, Red Flag Programs
a. Criteria
b. Contents
c. Procedures
4. Participation in interagency groups.

B. Special Services. Procedures for obtaining and billing for special services.

C. Training. Procedures for obtaining and billing for special services.

IV. WILDLAND FIRE AGENCY RESPONSIBILITIES

A. Operational support and predictive services.
1. Program management
2. Monitoring, feedback and improvement
3. Technology transfer
4. Agency computer systems
5. Fire weather observations
6. On-site support
7. Training

V. JOINT RESPONSIBILITIES

Negotiate service boundaries and fire weather forecast zones to meet customer and forecaster need.

VI. EFFECTIVE DATES ON THE AOP

VII. SIGNATURE PAGE

VIII. APPENDICES

A. Interagency Agreement for Meteorological Services in Support of Agencies with Land and Fire Management Responsibilities

B. Fire weather zone maps.

C. Catalog of fire weather observation sites.

APPENDIX B

Organizational Contacts

National Weather Service Headquarters

David Billingsley
NWS Fire Weather Program Leader (W/OS2)
3833 S. Development Ave.
Boise, ID 83705-5354

National Weather Service Eastern Region Headquarters

Harvey Thurm
NWS Eastern Region Fire Weather Program Leader (W/ER1x4)
Airport Corporate Center
630 Johnson Avenue
Bohemia, NY 11716-2626

National Interagency Fire Center (NIFC)

Larry Van Bussum
Staff Meteorologist to NIFC
NWS Boise
3833 S. Development Avenue
Boise, ID 83705-5354

NWS Forecast Offices

Stephen C. Wilkinson
Fire Weather Program Leader
NWS Charleston
5777 South Aviation Avenue
Charleston, SC 29406

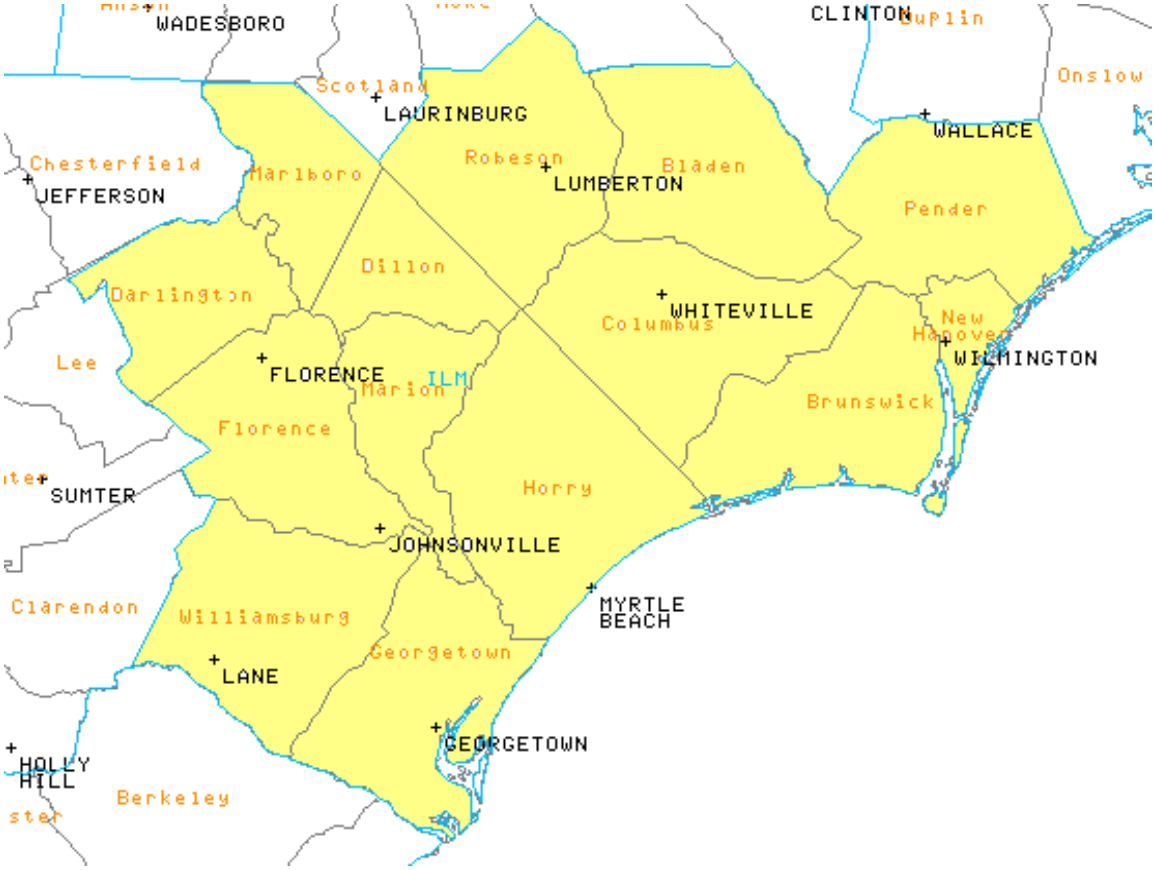
Jim Merrell
Fire Weather Program Leader
NWS Newport
53 Roberts Road
Newport, NC 28570

Bruce Cherry
Fire Weather Program Leader
NWS Columbia
2909 Aviation Way
West Columbia, SC 29210-2102

Phil Badgett
Fire Weather Program Leader
NWS Raleigh
1005 Capability Drive, Suite 300
Raleigh, NC 27606

APPENDIX C

Map of the NWS ILM Forecast Area



APPENDIX D

SAMPLE MORNING PRE-SUPPRESSION FORECAST

```
FNUS52 KILM 101325
FWFILM

FIRE WEATHER FORECAST
NATIONAL WEATHER SERVICE WILMINGTON NC
822 AM EST SUN DEC 10 2000

.DISCUSSION...
A COOL WEDGE OF HIGH PRES WILL REMAIN ACROSS THE CENTRAL CAROLINAS
TODAY. LOW PRES WILL DEVELOP OFF THE COAST AND MOVE NORTH OF
THE AREA TONIGHT. HIGH PRESSURE WILL BUILD IN FROM THE NORTHWEST ON
MONDAY.

NCZ087-096-SCZ017-023-024-032-033-039-102354-
BLADEN-DARLINGTON-DILLON-FLORENCE-MARION-MARLBORO-ROBESON-
WILLIAMSBURG-
822 AM EST SUN DEC 10 2000

                          TODAY       TONIGHT          MON
CLOUD AMOUNT               CLDY          CLDY         CLDY
PRECIP CHC (%)                5            10           10
PRECIP TYPE                NONE          NONE         NONE
MAX/MIN TEMP                 47            43           59
AM WIND                    N 10                       E 5
PM WIND                     N 8          NE 2         S 12
PRECIP AMOUNT          .01-.10             0            0
PRECIP DURATION               0             0            0
HUMIDITY (%)                 76           100           67
DSI                           1            --            1
INVERSION                  NONE          NONE         NONE
MIXING HGT                 1000            --         2000
TRANSPORT WIND            NE 10         -- --        SE 10
VENTILATION RATE          10000            --        20000
REMARKS...NONE
$$

NCZ097-099>101-SCZ034-046-102354-
BRUNSWICK-COLUMBUS-GEORGETOWN-HORRY-NEW HANOVER-PENDER-
822 AM EST SUN DEC 10 2000

                          TODAY       TONIGHT          MON
CLOUD AMOUNT               CLDY          CLDY         CLDY
PRECIP CHC (%)               10            10           10
PRECIP TYPE                NONE          NONE         NONE
MAX/MIN TEMP                 53            47           62
AM WIND                    N 10                       E 5
PM WIND                    NE 8           N 5        SE 10
PRECIP AMOUNT          .01-.10             0            0
PRECIP DURATION               0             0            0
HUMIDITY (%)                 66           100           63
DSI                           1            --            1
INVERSION                  NONE          NONE         NONE
MIXING HGT                 1000            --         2000
TRANSPORT WIND            NE 10         -- --        SE 10
VENTILATION RATE          10000            --        20000
REMARKS...NONE
$$

.FORECAST EXTENDED...
.MONDAY NIGHT...MOSTLY CLOUDY.  LOWS IN THE LOWER 50S.
.TUESDAY...PARTLY CLOUDY WITH A CHANCE OF SHOWERS.  WARMER AND
BREEZY.  HIGHS IN THE UPPER 60S.
.WEDNESDAY...TURNING COOLER WITH RAIN LIKELY.  LOWS IN THE LOWER 40S
AND HIGHS NEAR 50.
.THURSDAY...CLOUDY WITH A CHANCE OF RAIN DURING THE DAY...THEN PARTLY
CLOUDY.  LOWS NEAR 40 AND HIGHS IN THE MID 50S.
.FRIDAY...PARTLY CLOUDY.  LOWS AROUND 40.  HIGHS IN THE MID 50S.
.SATURDAY...MOSTLY CLOUDY WITH A SLIGHT CHANCE OF RAIN.  LOWS AROUND
40.  HIGHS AROUND 60.


.OUTLOOK 8 TO 14 DAY...
TEMPERATURE NEAR NORMAL. PRECIPITATION NEAR NORMAL.
```

...TABLE ON PAGE D3 INSERTED HERE...

NNNN

APPENDIX D

SAMPLE AFTERNOON PRE-SUPPRESSION FORECAST

```
FNUS52 KILM 102009
FWFILM

FIRE WEATHER FORECAST
NATIONAL WEATHER SERVICE WILMINGTON NC
305 PM EST SUN DEC 10 2000

.DISCUSSION...
A COOL WEDGE OF HIGH PRES WILL REMAIN ACROSS THE CENTRAL
CAROLINAS  INTO MIDDAY MONDAY. LOW PRES WILL DEVELOP OFF THE
COAST AND MOVE NORTH OF  THE AREA TONIGHT.

NCZ087-096-SCZ017-023-024-032-033-039-110801-
BLADEN-DARLINGTON-DILLON-FLORENCE-MARION-MARLBORO-ROBESON-
WILLIAMSBURG-
305 PM EST SUN DEC 10 2000

                      TONIGHT          MON    MON NIGHT         TUE
CLOUD AMOUNT          MO CLDY         CLDY         CLDY     MO CLDY
PRECIP CHC (%)             10           20           10          50
PRECIP TYPE           DRIZZLE      DRIZZLE         NONE        NONE
MAX/MIN TEMP               38           58           52          64
AM WIND                               NW 2                     SE 15
PM WIND                  N 2          NW 8        SE 10       SE 20
PRECIP AMOUNT              0            0            0           0
PRECIP DURATION            0            0            0           0
HUMIDITY (%)             100           59          100          52
DSI                       --            1           --           1
INVERSION                 --            8           --          18
MIXING HGT                --         1200           --        3000
VENTILATION RATE          --         9600           --       54000
TRANSPORT WIND         -- --           NE        -- --          NW
REMARKS...NONE
$$

NCZ097-099>101-SCZ034-046-110801-
BRUNSWICK-COLUMBUS-GEORGETOWN-HORRY-NEW HANOVER-PENDER-
305 PM EST SUN DEC 10 2000

                      TONIGHT          MON    MON NIGHT         TUE
CLOUD AMOUNT             CLDY         CLDY         CLDY     PT CLDY
PRECIP CHC (%)             10           20           10          50
PRECIP TYPE           DRIZZLE      DRIZZLE         NONE        NONE
MAX/MIN TEMP               40           62           54          65
AM WIND                               N 2                     SW 15
PM WIND                 NW 2          N 8        SW 10       SW 20
PRECIP AMOUNT              0            0            0           0
PRECIP DURATION            0            0            0           0
HUMIDITY (%)             100           55          100          49
DSI                       --            1           --           1
INVERSION                 --            8           --          18
MIXING HGT                --         1500           --        3000
TRANSPORT WIND         -- --           NE        -- --          NW
VENTILATION RATE          --        12000           --       54000
REMARKS...NONE
$$

.FORECAST EXTENDED...
.TUESDAY NIGHT...PARTLY CLOUDY AND BREEZY.  LOWS IN THE UPPER 30S.
.WEDNESDAY...BECOMING CLOUDY.  A CHANCE OF RAIN FROM EARLY AFTERNOON
ON.  COOLER.  HIGHS NEAR 50.
.THURSDAY...MOSTLY CLOUDY.  A CHANCE OF SHOWERS DURING THE DAY.  LOWS
IN THE MID 40S AND HIGHS NEAR 60.
.FRIDAY...PARTLY CLOUDY.  LOWS IN THE UPPER 30S AND HIGHS IN THE MID
50S.
.SATURDAY...PARTLY CLOUDY WITH A CHANCE OF RAIN. LOWS NEAR 40. HIGHS
NEAR 60.
.SUNDAY...PARTLY CLOUDY WITH A CHANCE OF RAIN. LOWS IN THE LOWER 40S.
HIGHS IN THE LOWER 60S.


.OUTLOOK 8 TO 14 DAY...
TEMPERATURE NEAR NORMAL. PRECIPITATION NEAR NORMAL.
```

...TABLE ON PAGE D3 INSERTED HERE...

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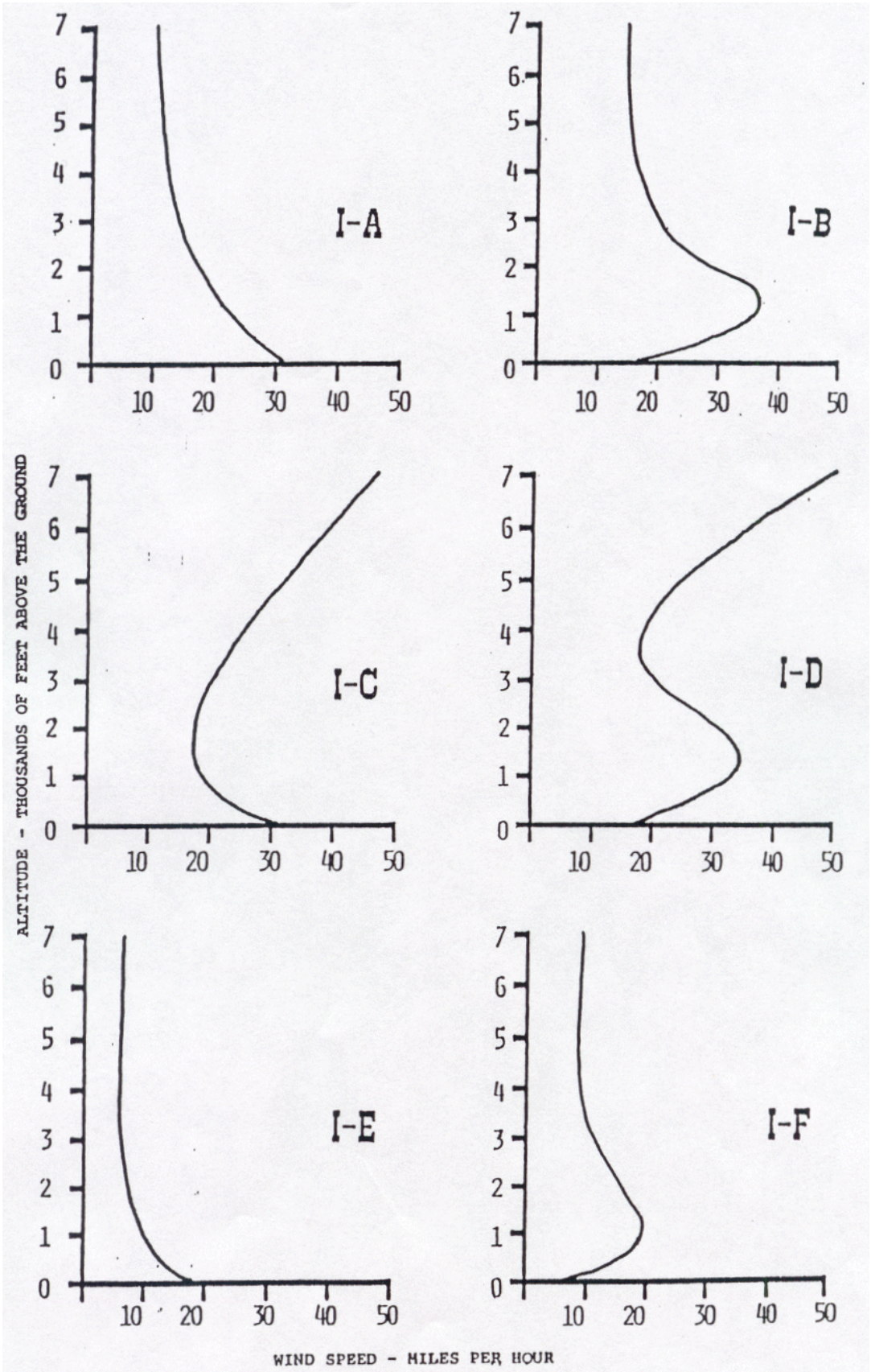
APPENDIX D

SC USERS		NC USERS
VENTILATION RATE(FT/MPH)	BURN CATEGORY	VENTILATION RATE (FT*MPH)
0 TO 17249	1	0 TO 33499
17250 TO 34499	2	33500 TO 44999
34500 TO 51749	3	45000 TO 59999
51750 TO 68999	4	60000 TO 111999
69000 OR GREATER	5	112000 OR GREATER

SC USERS		NC USERS
FORECAST SURFACE WIND	DISPERSION	FORECAST SURFACE WIND
	STAGNANT	NEAR CALM
CALM	VERY POOR	2 TO 4 MPH
2 TO 5 MPH	POOR	5 TO 8 MPH
6 TO 8 MPH	FAIR	9 TO 12 MPH
9 TO 13 MPH	GOOD	GREATER THAN 12 MPH
14 MPH OR MORE	EXCELLENT	

APPENDIX E

KEY TO ADVERSE WIND PROFILES



APPENDIX F

Spot Forecast Request Form D-1

See the last page of this document for a copy of Form D-1 which can be photocopied for operational use.

APPENDIX G

SAMPLE NATIONAL FIRE DANGER RATING SYSTEM (NFDRS) POINT FORECASTS

```
FCST,319701,021015,13,6,67,90,1,1,E,15,,67,55,100,67,1,5,Y
FCST,319301,021015,13,6,67,90,1,1,ENE,15,,67,55,100,67,1,5,Y
FCST,319803,021015,13,6,70,93,1,1,E,15,,72,59,100,69,2,4,Y
FCST,319802,021015,13,6,69,94,1,1,E,15,,71,57,100,67,2,4,Y
```

APPENDIX H

NWS Red Flag Criteria

At least two of the following must be occurring or be forecast to occur:

1. Sustained surface wind of 20 mph or greater for a significant duration during the forecast period (roughly 6 hours or more).

2. Significant wind shift (front, sea breeze, etc.) during a period of active fire suppression efforts.

3. Minimum relative humidity of 25 percent or lower.

4. Strong potential for lightning, especially after an extended hot and dry period or when dry lightning (little or no rain) is expected.

Since many combinations of weather and fuel conditions can lead to a Red Flag Event, these criteria serve merely as guidelines with which a forecaster can assess the meteorological conditions which might lead to extensive wildfire occurrences or to extreme fire behavior. Therefore, the fire weather forecaster will ALWAYS coordinate with the appropriate land management officials before issuing a Fire Weather Watch or Red Flag Warning. Coordination calls should include discussion of fuel moisture, KBDI's, seasonal concerns, and current fire suppression efforts.

SAMPLE RED FLAG WARNING

```
ZCZC RDURFWILM
TTAA00 KILM DDHHMM
RED FLAG WARNING
NATIONAL WEATHER SERVICE WILMINGTON NC
825 AM EDT FRI APR 16 1999

...A RED FLAG WARNING IS IN EFFECT FOR NORTHEAST SOUTH CAROLINA AND SOUTHEAST NORTH CAROLINA FOR
STRONG WEST WINDS AND LOW HUMIDITIES THIS AFTERNOON...

THIS WATCH INCLUDES THE FOLLOWING COUNTIES:

IN NORTH CAROLINA: BLADEN...BRUNSWICK...COLUMBUS...NEW HANOVER... PENDER AND ROBESON.

IN SOUTH CAROLINA: DARLINGTON...DILLON...FLORENCE...GEORGETOWN...HORRY...MARION... MARLBORO AND
WILLIAMSBURG.

A STRONG COLD FRONT WILL DROP INTO THE CAROLINAS FROM THE NORTH TONIGHT.  IN ADVANCE OF THE
FRONT...WEST WINDS OF 20 TO 30 MPH WITH HIGHER GUSTS ARE EXPECTED THIS AFTERNOON.  IN ADDITION...THE
WESTERLY FLOW WILL USHER IN VERY DRY AIR WITH AFTERNOON HUMIDITIES EXPECTED TO BE AROUND 20 PERCENT.

PLEASE ADVISE THE APPROPRIATE OFFICIALS OR FIRE CREWS IN THE FIELD OF THIS RED FLAG WARNING.

TWF

NNNN
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SAMPLE RED FLAG WARNING CANCELLATION

ZCZC RDURFWILM
TTAA00 KILM DDHHMM
RED FLAG WARNING CANCELLATION
NATIONAL WEATHER SERVICE WILMINGTON NC
200 PM EDT FRI APR 16 1999

...RED FLAG WARNING FOR NORTHEAST SOUTH CAROLINA AND SOUTHEAST NORTH CAROLINA CANCELLED...

A STRONG COLD FRONT HAS STALLED OVER THE MID-ATLANTIC REGION...WELL NORTH OF THE AREA. THE FRONT IS EXPECTED TO BEGIN MOVING SOUTH AGAIN TONIGHT. STRONG WESTERLY WINDS OF 20 TO 30 MPH ARE STILL EXPECTED IN ADVANCE OF THE FRONT BUT RELATIVE HUMIDITY VALUES ARE EXPECTED TO RECOVER TO AROUND 40 PERCENT BEFORE THE ONSET OF THE STRONG WINDS.

TWF

NNNN

SAMPLE FIRE WEATHER WATCH

ZCZC RDURFWILM
TTAA00 KILM DDHHMM
FIRE WEATHER WATCH
NATIONAL WEATHER SERVICE WILMINGTON NC
825 AM EDT MON APR 19 1999

...A FIRE WEATHER WATCH IS IN EFFECT FOR ALL OF SOUTHEAST NORTH CAROLINA AND NORTHEAST SOUTH CAROLINA FOR TUESDAY AFTERNOON FOR STRONG SOUTHWEST WINDS AND LOW HUMIDITIES...

THIS WATCH INCLUDES THE FOLLOWING COUNTIES:

IN NORTH CAROLINA: BLADEN...BRUNSWICK...COLUMBUS...NEW HANOVER...PENDER AND ROBESON.

IN SOUTH CAROLINA: DARLINGTON...DILLON...FLORENCE...GEORGETOWN...HORRY...MARION... MARLBORO AND WILLIAMSBURG.

A STRONG COLD FRONT IS EXPECTED TO MOVE INTO THE CAROLINAS FROM THE NORTHWEST ON TUESDAY. STRONG SOUTHWEST WINDS AND LOW HUMIDITIES ARE EXPECTED AHEAD OF THE FRONT TUESDAY AFTERNOON.

PLEASE ADVISE THE APPROPRIATE OFFICIALS OR FIRE CREWS IN THE FIELD OF THIS FIRE WEATHER WATCH.

TWF

NNNN

SAMPLE FIRE WEATHER WATCH CANCELLATION

ZCZC RDURFWILM
TTAA00 KILM DDHHMM
FIRE WEATHER WATCH CANCELLATION
NATIONAL WEATHER SERVICE WILMINGTON NC
825 AM EDT TUE APR 20 1999

...FIRE WEATHER WATCH FOR ALL OF SOUTHEAST NORTH CAROLINA AND NORTHEAST SOUTH CAROLINA CANCELLED...

A STRONG COLD FRONT IS EXPECTED TO MOVE INTO THE CAROLINAS FROM THE NORTHWEST ON THIS AFTERNOON. STRONG SOUTHWEST WINDS HAVE ALREADY DEVELOPED AHEAD OF THE FRONT AND HAVE RETURNED ENOUGH MOISTURE TO THE AREA TO KEEP AFTERNOON HUMIDITY VALUES ABOVE 25 PERCENT.

TWF

Signatory Page

The following signatories have agreed to the terms and conditions of this Annual Operating Plan, which is subject to revision on a least an annual basis, or more frequently as operations necessitate. Actual signatures are maintained on file.

John A. Quagliariello Jr. Date
Fire Weather Program Leader
National Weather Service Wilmington, NC

Carl Johnson Date
North Carolina Forest Service

Miles Knight Date
South Carolina Forestry Commission

Ann Childress Date
Moores Creek National Battlefield
National Park Service

WS FORM D-1
(12-86)
Pres. By WSOM D-41

U. S. DEPARTMENT OF COMMERCE
NOAA
NATIONAL WEATHER SERVICE

FIRE WEATHER SPECIAL FORECAST REQUEST

(See reverse for instructions)

I - REQUESTING AGENCY WILL FURNISH:

1. NAME OF FIRE OR OTHER PROJECT	2. CONTROL AGENCY	3. REQUEST MADE	
		TIME+	DATE

4. LOCATION (by 1/4Sec-Sec_Twp-Range)	5. DRAINAGE NAME	6. EXPOSURE (NE,E,SE,etc.)

7. SIZE OF PROJECT (Acres)*	8. ELEVATION*		9. FUEL TYPE	10. PROJECTION ON:
	TOP	BOTTOM		☐ GROUND ☐ CROWNING

11. **WEATHER CONDITIONS AT PROJECT OR FROM NEARBY STATIONS** (See Example on reverse)

PLACE	ELE-VATION	OB TIME+	WIND DIR. - VEL.		TEMP.		++(Lv.Blank)		REMARKS (Indicate rain, thunderstorms, etc. Also wind condition and 10ths of cloud cover)
			20 FT	EYE LEVEL	DRY	WET	RH	DP	

12. **SEND FORECAST TO:**	PLACE	VIA : FAX PHONE	ATTN: (Name, if applicable)

II. FIRE WEATHER FORECASTER WILL FURNISH:

13. FORECAST AND OUTLOOK:
(Specify Wind - 20 foot or Eye Level)

TIME+ AND DATE:

NAME OF FIRE WEATHER FORECASTER	FIRE WEATHER OFFICE WILMINGTON, NC

III - REQUESTING AGENCY WILL COMPLETE UPON RECEIPT OF FORECAST

IV - FORECAST RECEIVED:	TIME +	DATE	NAME

EXPLANATION OF SYMBOLS

+ Use 24-hour clock to indicate time. Example: 10:15 p.m. = 2215 a.m. = 1015
* For concentrations (as groups of lightning fires) specify "concentration"; then give number of fires and size of largest. If concentrations are in more than one drainage, request special forecast for each drainge.
++No entry necessary. To be computed by Fire Weather Forecaster

WS FORM D-1 SUPERSEDES PREVIOUS EDITIONS